Shippensburg University
College of Education and Human Services
Exercise Science Major

What is Exercise Science?
Exercise Science is the study of exercise and physical activity and how the body responds. The field is comprised of various sub-disciplines including exercise physiology, biomechanics, motor behavior, and the psychology of physical activity. Students interested in the Exercise Science major should have a strong background in the sciences including biology, mathematics, chemistry, and physics.

Exercise scientists rely on scientific principles in these areas to advance their understanding of how the body responds to exercise and to advocate physical activity to prevent and treat diseases such as diabetes and heart disease.

What are my career options?
Traditionally, exercise scientists have focused on enhancing athletic performance. Currently, exercise scientists also work and study in commercial, clinical, and workplace settings to increase health, fitness, and quality of life of the general population.

An entry-level career within the field of exercise science may have a starting pay range of $25,000-35,000.

Exercise Scientist employment opportunities include but are not limited to:

- Wellness Program Coordinator
- Cardiopulmonary Rehabilitation Specialist
- Group Exercise Instructor
- Biomechanist
- Exercise Physiologist
- Corporate or Recreational Fitness Director
- Certified Personal Trainer
- Certified Strength and Conditioning Coach
- Exercise Test Technologist
- Sales or Marketing of Medical/Fitness Equipment
- Pharmaceuticals sales
- Geriatric Recreational Therapist

The following career paths are additional options for exercise science students. These positions may require further training and/or education.

- Dietitian or Sports Nutritionist
- Occupational or Physical Therapist
- Medical Doctor or Physician's Assistant
- Athletic Trainer
- Nursing
- Researcher
- Academician
- Chiropractor

What courses are required?
Students enrolled in the Exercise Science program will take a minimum of 120 credits including:

1. Basic core courses (51 credits) comprised of General Education courses:
   - Writing Intensive First Year Seminar (ENG 106) OR Adv Placement Writing (ENG 110)
   - Intro to Human Communication (HCS 100)
   - Foundations of Global Cultures (HIS 105)
   - Thinking Historically in a Global Age (HIS 106)
   - Applied Statistics (MAT 117)
   - Category A
   - Literature
   - Humanities
   - Humanities
   - Biology (BIO 161)
   - Chemistry: An Observational Approach (CHM 105)
   - Intro Physics I Lecture (PHY 121)
   - Intro Physics I Lab (PHY 123)
   - ECO, GEO, or PLS
   - ECO, GEO, or PLS
   - General Psychology (PSY 101)
   - Intro to Sociology (SOC 101) OR Intro to Women's Studies (WST 100)

2. Science core courses (12 credits) including:
   - Biology (BIO 162)
   - Human Anatomy (BIO 371)
   - Human Physiology (BIO 350)
   - BIO Elective
   - Needed to complete Biology Minor

3. Exercise Science Courses (45-51 credits)
   - Mechanical Analysis of Sport Skills (ESC 244)
   - Introduction to Kinesiology (ESC 250)
   - Exercise Physiology I (ESC 321)
   - Biomechanics (ESC 333)
   - Motor Behavior (ESC 336)
   - Prevention and Care of Athletic Injuries (ESC 340)
   - Nutrition for Sport & Fitness (ESC 350)
   - Psychology of Physical Activity (ESC 352)
   - Research Design and Statistics for Exercise Science (ESC 353)
   - Cardiac Rehab & Special Populations (ESC 420)
   - Exercise Physiology II (ESC 421)
   - Exercise Testing & Prescription (ESC 422)
   - Internship (ESC 424)

4. Electives (6 – 12 credits)
   - Elective
   - Elective
   - Elective

Recommended electives:

- ESC 207 Stress Management
- ESC 213 Org & Ad for Health, Fitness, & Sport Facilities
- ESC 339 Seminars (TBA)
- BIO 220 Microbiology
- BIO 260 Genetics
- GRN 100 Intro to Gerontology
- SOC 275 Sociology of Sport & Leisure (fall only)

August 2012
Required Exercise Science Course Descriptions

ESC 244 Mechanical Analysis of Sport Skills (3 Credits)
Provides students with knowledge on anatomical and mechanical principles of sport skills. Open to Exercise Majors/Minors and Coaching Minors only until schedule clean-up.

ESC 250 Introduction to Kinesiology (3 Credits)
Serves as an introduction to a variety of subdisciplines within the discipline of Kinesiology. The introduction may include the subdisciplines of Biomechanics, Exercise Physiology, Motor Learning and Control, Sport and Exercise Psychology, and Sport Sociology. Open to Exercise Science Majors/Minors only until schedule clean-up.

ESC 321 Exercise Physiology I (4 Credits)
Focuses on the development of knowledge in applied physiology as a basis for understanding the physiological responses and adaptations related to acute and chronic exercise stress. Includes applied learning experiences that facilitate student understanding. 3 hour lecture 1 hour lab Prerequisites: ESC 250 (Pre/Co), BIO 161 & BIO 162.
Open to Exercise Science Majors only.

ESC 333 Biomechanics (3 Credits)
This course is the study of qualitative and quantitative analysis of mechanical principles of human motion. Quantitative analysis will include the kinematic and kinetic description of linear and angular motion associated with sport skills and exercise activities. Prerequisites: ESC 244, ESC 250, BIO 371 & PHY 121.
Open to Exercise Science Majors only.

ESC 336 Motor Behavior (3 Credits)
Sub-discipline of exercise science concerned with the understanding of the processes responsible for the acquisition, performance, and retention of motor skills. This will be explored through motor learning, motor control, and motor development throughout a lifespan. Prerequisite: ESC 250
Open to Exercise Science Majors/Minors only until schedule clean-up.

ESC 340 Prevention and Care of Athletic Injuries (3 Credits)
Provides knowledge and competencies in the prevention and care of athletic injuries. The course also provides training techniques in first aid and CPR (Cardio-Pulmonary Resuscitation). Open to Exercise Science Majors/Minors and Coaching Minors. Prerequisites: ESC 250(Pre/Co), BIO 161 & BIO 162

ESC 350 Nutrition for Sport & Fitness (3 Credits)
Prerequisites: ESC 243 or ESC 321.
Open to Exercise Science Majors/Minors until schedule clean-up.
Health science students will be admitted during schedule adjustment.

ESC 352 Psychology of Physical Activity (3 Credits)
Provides the student with content on four major topic areas: (1) research methods and potential biases in the behavioral sciences, (2) the effects of exercise and physical activity on mental health, (3) behavioral approaches and theories to understanding and influencing physical activity, and (4) psychosocial factors as they relate to health, chronic disease, and pain. This course emphasizes a biopsychosocial approach to health and illness. Issues unique to children, older adults, those with chronic disease and disability, women, and people of color will be highlighted. Sensitivity to diversity, including race, class, ethnicity, and gender will be emphasized throughout the course.
Prerequisites: ESC 250 & PSY 101.
Open to Exercise Science Majors/Minors only until schedule clean-up.

ESC 353 Research Design and Statistics for Exercise Science (3 Credits)
This course will provide the student with an understanding and interpretation of research methods within Exercise Science. Students will learn the basic concepts for designing a research project within Exercise Science. They will be introduced to data collection, data analysis, presentation of the data, and ethical principles surrounding research.
Prerequisites: ESC 244, ESC 321 & MAT 117.
Open to Exercise Science Majors only.

ESC 420 Cardiac Rehab & Special Populations (4 credits)
Provides students with a technical expertise in cardiac rehabilitation and basic ECG interpretation. Population specific issues related to children, females, elderly, diabetes and cancer as well as other chronic diseases and how they relate to exercise will be explored.
3 hours lecture 1 hour lab
Prerequisite: ESC 321.
Open to Exercise Science Majors only.

ESC 421 Exercise Physiology II (4 credits)
Provides students with an understanding of the physiology of exercise with an emphasis on the physiological responses and adaptations to exercise, the relationship between health and fitness, and the physiology of athletic performance.
3 hour lecture 1 hour lab
Prerequisite: ESC 321.
Open to Exercise Science Majors only.

ESC 422 Exercise Testing and Prescription (3 Credits)
This course is designed to aid students in gaining the knowledge and practical application of testing, programming and techniques associated with fitness training. This fitness training will be based on cardio respiratory, flexibility and resistance training guidelines from the American College of Sports Medicine (ACSM) and the National Strength and Conditioning Association (NSCA).
Prerequisite: ESC421 (Pre/Co).
Open to Exercise Science Majors only.
**ESC 424 Internship (6/9/12 Credits)**

The internship component of the Exercise Science program offers students a practical, research, observational, study and/or work experience within an area or a career path of their choice. The internship will enhance student learning through constructive participation within the field of Exercise Science. Prerequisites: 2.50 QPA overall; must have completed all exercise science major course requirements with a grade of "C" or above and be an Exercise Science major.

Students eligible for ESC 424 must provide current documentation of the following prior to scheduling:

1. First Aid certification
2. CPR certification Adult w/AED
3. Child Abuse clearance
4. Criminal Record clearance
5. TB test
6. Liability Insurance

**Will I become certified?**

All students will be required to take one certification exam at the student's expense. These include:

- American College of Sports Medicine (ACSM) Certified Health Fitness Specialist Exam [www.acsm.org](http://www.acsm.org)
- American College of Sports Medicine (ACSM) Certified Personal Trainer (CPT) exam [www.acsm.org](http://www.acsm.org)
- National Strength and Conditioning Association (NSCA) Certified Personal Trainer (CPT) exam [www.nsca-cc.org](http://www.nsca-cc.org)
- National Strength and Conditioning Association (NSCA) Certified Strength and Conditioning Specialist (CSCS) exam [www.ncsa-cc.org](http://www.ncsa-cc.org)

All students are required to be certified by attending an American Red Cross (ARC) or American Heart Association (AHA) or National Safety Council (NSC) workshop (at the students' expense) in:

- First Aid Certification
- CPR/AED Adult Certification

**What are the internship opportunities?**

Students are required to complete a 6, 9, or 12-credit internship. Internship sites may include hospitals, wellness centers, health care facilities, corporate fitness facilities, spas, resorts, and fitness centers. Internships may also be available with government agencies, nursing homes, and community agencies.

**What are the program admissions requirements?**

Freshmen are selected for initial entry into the Exercise Science program through the Admissions Office. Standards for admission include the top 20% of their high school class and a SAT of greater than 950, or 40% and 1050.

Transfer students, both internal and external, are selected for admission based on the following criteria:

1. Academic proficiency in college or university course work, including a 2.75 GPA.
2. A grade of "C" or higher in Principles of Biology I or II
3. A change of major/minor form provided from the Dean of their current major.

Selection is competitive and students will be selected from those who fulfill all of the above requirements.

**POLICY:**

Any student may enroll and complete any course in the Department of Exercise Science. Prerequisites for any course must be completed prior to enrollment. **Students may complete no more than 3 Exercise Science major courses within the Department of Exercise Science without admission into the Exercise Science major.**

**Why should I study Exercise Science at Shippensburg University?**

- Exercise Science classes at Shippensburg University are small, typically 20 students or less.
- Lectures and labs are taught by seasoned professors; not by graduate students.
- Faculty-directed student research is highly encouraged at Shippensburg University.

**Shippensburg University has the only on-site elementary school in the state and one of only a handful in the country. The Grace B. Luhrs University Elementary School provides opportunities for exercise science students to conduct pediatric exercise testing and programming. Information about the Luhrs School can be found on the web at [www.ship.edu/labschool](http://www.ship.edu/labschool)**

**Where can I get more information about Exercise Science at Shippensburg University?**

For specific program information, contact:

- Exercise Science Department
- Henderson Gym 109
- Shippensburg University
- 1871 Old Main Drive
- Shippensburg, PA 17257-2299
- Phone: 717-477-1721
- Fax: 717-477-4083
- E-mail:constance@ship.edu

Web site: [www.ship.edu/exercisescience](http://www.ship.edu/exercisescience)

**Exercise Science Club Info**

The Exercise Science Club focuses on helping majors and students interested in exercise in areas of professional development, mentorship, fellowship, and community involvement. The club currently helps out with the Shippensburg Wellness Fair, hosts and participates in athletic fundraising events, enjoys educational and fellowship trips, and is seeking involvement with the new student recreation center. Opportunities are plenty to serve and become involved, so make a move to impact your future.
SAMPLE FOUR YEAR PLAN AND PREREQUISITES

Please remember that this is just a sample schedule.
There are many different ways course may be distributed over four years.

<table>
<thead>
<tr>
<th>MAJOR COURSES</th>
<th>PREREQUISITES</th>
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<tbody>
<tr>
<td><strong>Fall – Freshman Year</strong> 16 credits</td>
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<tr>
<td>BIO 161 Principles of Biology: Cell Structure</td>
<td>No Prerequisites</td>
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<td>and Function (4cr)</td>
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<tr>
<td><em>Up to 12 Additional Credits</em></td>
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<tr>
<td><strong>Spring – Freshman Year</strong> 16 credits</td>
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<tr>
<td>BIO 162 Principles of Biology: Organismal Diversity</td>
<td>No Prerequisites</td>
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<td>(4cr)</td>
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<td><em>Up to 12 Additional Credits</em></td>
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<tr>
<td><strong>Fall – Sophomore Year</strong> 16 credits</td>
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<tr>
<td>ESC 250 Intro to Kinesiology (3cr)</td>
<td>No Prerequisites</td>
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<td><em>Up to 12 Additional Credits</em></td>
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<td><strong>Spring – Sophomore Year</strong> 16 credits</td>
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<tr>
<td>ESC 244 Mechanical Analysis (3cr)</td>
<td>No Prerequisites</td>
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<tr>
<td>BIO 350 Human Physiology I (4cr)</td>
<td>BIO 161 &amp; BIO 162 (old BIO 115&amp;116)</td>
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<td>ESC 352 Psychology of Physical Activity (3cr)</td>
<td>PSY 101 &amp; ESC 250</td>
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<td><em>Up to 6 Additional Credits</em></td>
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<td><strong>Fall – Junior Year</strong> 16 credits</td>
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<tr>
<td>BIO 371 Human Anatomy <em>(Fall Only)</em> (4cr)</td>
<td>BIO 161 &amp; BIO 162 (old BIO 115&amp;116)</td>
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<tr>
<td>PHY 121 Physics Lecture <em>(Fall Only)</em> (3cr)</td>
<td>BIO 350 &amp; ESC 250 (Pre/Co)</td>
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<td>PHY 123 Physics LAB <em>(Fall Only)</em> (1cr)</td>
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<td>ESC 321 Exercise Physiology I (4cr)</td>
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<td><em>Up to 4 Additional Credits</em></td>
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<td><strong>Spring – Junior Year</strong> 16 credits</td>
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<tr>
<td>ESC 333 Biomechanics <em>(Spring Only)</em> (3cr)</td>
<td>ESC 244, ESC 250, BIO 371, PHY 121</td>
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<td>ESC 336 Motor Behavior (3cr)</td>
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<td>ESC 244 (Pre/Co), BIO 161 &amp; 162</td>
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<td><strong>Fall – Senior Year</strong> 16 credits</td>
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<td>ESC 353 Research Design &amp; Stat for ExSci (3cr)</td>
<td>MAT 117, ESC 244 &amp; ESC 321</td>
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<td>ESC 422 Exercise Testing &amp; Prescription (3cr)</td>
<td>ESC 421 (Pre/Co)</td>
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<td><em>Up to 2 Additional Credits</em></td>
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<td><strong>Spring – Senior Year</strong> 12 credits</td>
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<td>ESC 424 Internship (6/9/12 credits)</td>
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<td>be an Exercise Science major.</td>
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